

COLONY OF THE GAMBIA.

ANNUAL MEDICAL AND SANITARY REPORT FOR THE YEAR 1914.

CONTENTS.

	PAGE.
COVERING LETTER OF SENIOR MEDICAL OFFICER	3
MEDICAL REPORT—	
I. ADMINISTRATIVE—	
(A) STAFF	5
(B) FINANCIAL	6
II. PUBLIC HEALTH—	
(A) GENERAL REMARKS	6
(B) EUROPEAN OFFICIALS	7
(C) NATIVE OFFICIALS	7
(D) GENERAL EUROPEAN POPULATION	8
(E) GENERAL NATIVE POPULATION	8
SANITARY REPORT—	
I. ADMINISTRATIVE... ..	11
II. PREVENTIVE MEASURES—	
(A) MOSQUITO- AND INSECT-BORNE DISEASES	12
(B) EPIDEMIC DISEASES	14
(C) HELMINTHIC DISEASES	16
III. GENERAL MEASURES—	
SEWAGE DISPOSAL	16
REFUSE DISPOSAL	16
SURFACE DRAINS	17
PIPE-BORNE WATER SUPPLY	17
“ DUTTON SCHEME ”	18
BUSH CLEARING, ETC.	20
GOVERNMENT BUILDINGS	21
STREETS	22
WELLS AND TANKS	22
TEACHING OF HYGIENE	22
RECOMMENDATIONS FOR FUTURE WORK	23
HOSPITAL RETURNS	24
PROTECTORATE	25
MACCARTHY ISLAND	26
SCIENTIFIC (REPORT BY DR. R. H. MILLER)	27
RETURNS—	
STAFF	28
FINANCIAL	30
POPULATION	31
ROUTINE SANITARY WORK, BATHURST	32
METEOROLOGICAL	38
DISEASES AND DEATHS (IN-PATIENTS)	39
CASES (OUT-PATIENTS)	40

MEDICAL OFFICE,

BATHURST,

GAMBIA,

12th April, 1915.

SIR,

I have the honour to submit, for the information of His Excellency the Governor and transmission to the Right Honourable the Secretary of State for the Colonies, the Medical and Sanitary Report for the Colony of the Gambia for the year ended 31st December, 1914.

I have the honour to be,

Sir,

Your obedient servant,

A. E. HORN,

Senior Medical Officer.

THE HONOURABLE

THE COLONIAL SECRETARY,

BATHURST, GAMBIA.

Annual Medical and Sanitary Report

FOR THE

YEAR ENDING 31ST DECEMBER, 1914.

I. ADMINISTRATIVE.

(a) STAFF.

Dr. A. E. Horn, Senior Medical Officer, was appointed on the 22nd of January, *vice* Dr. E. A. Chartres, 1st Grade Senior Medical Officer, Nigeria (Northern Provinces), and assumed duty in charge of the Medical Department on February the 5th.

Dr. T. F. G. Mayer, Medical Officer, acted as Senior Medical Officer from the beginning of the year until the 4th of February. He proceeded on leave on the 4th of November, and his appointment in the Gambia was terminated on the 31st of December, when he was promoted Senior Medical Officer in Sierra Leone.

Dr. R. W. Orpen, Medical Officer, Sierra Leone, was appointed Medical Officer of Health, *vice* Dr. A. F. Kennedy, on the 3rd of October. He assumed duty in Bathurst on the 16th of October.

Dr. A. F. Kennedy proceeded on leave on the 7th of March and was transferred to Nigeria during leave.

Dr. F. C. V. Thompson was in medical charge of MacCarthy Island Station until the 6th of April, when he returned to headquarters and was attached to the Victoria Hospital. He proceeded on leave on August the 9th and reassumed duty in Bathurst on the 5th of December.

Dr. R. H. Miller acted as Medical Officer in Bathurst from the beginning of the year until the 11th of April, when he assumed duty at MacCarthy Island Station, returning to Bathurst on the 27th of June. He left the Gambia on the 9th of November for active service in the Cameroons.

Dr. T. Ryan was appointed Medical Officer, *vice* Dr. S. L. Brohier, transferred to the Gold Coast, on the 7th of May. He assumed duty on the 23rd of May, and assisted in the duties of Medical Officer of Health from that date until the 16th of October, when he was attached as Medical Officer to the Victoria Hospital, Bathurst.

Dr. R. H. Kennan, Senior Sanitary Officer, visited the Colony in January and again in April. The arrangement by which his functions extended to the Colony was terminated on December the 31st.

At the end of the year, therefore, the Medical Staff of the Colony was reduced to the Senior Medical Officer, the Medical Officer of Health and two Medical Officers.

Of the Nursing Staff:—

Miss L. E. H. Maulton, Nursing Sister, proceeded on leave on the 8th of May, and was seconded for service in the Cameroons on the 31st of August.

Miss R. Roddan proceeded on leave on the 25th of September.

Miss K. M. Gordon was appointed Nursing Sister in charge on the 7th of May, and assumed duty on the 23rd of May. She was invalided to England on the 26th of December.

Miss E. A. Bernard was appointed Nursing Sister on the 24th of October and assumed duty on the 7th of November.

(b) FINANCIAL.

The total revenue raised was £172 19s. 10d., and the expenditure during the year amounted to £9,130 13s. 9d.; an excess being incurred on certain items, although some saving was effected upon others.

II. PUBLIC HEALTH.

(a) GENERAL REMARKS.

The health of both Europeans and Natives remained good on the whole throughout the year.

Plague in Dakar and other towns of French Senegambia was a cause of anxiety to the Colony during the year. On the declaration of the infection at Dakar, in May and again in July, quarantine of ships was enforced at Bathurst and other preventive measures were put in force (*see* Sanitary Report, page 14). No case of the disease occurred in the Colony or Protectorate.

Small-pox showed some recrudescence in parts of the Colony and the Protectorate, but was dealt with by vaccination, fumigation, and isolation.

Chicken-pox in a virulent form is not uncommon; it has occurred in waves in the Colony and Protectorate, but fortunately seldom terminates fatally.

The diagnosis between cases of small-pox and chicken-pox, when fully developed, may be a matter of considerable difficulty. This is referred to by Dr. Kennan on page 24 of the Annual Medical Report of this Colony for 1913, and I hope that further enquiries will be made on the question.

As usual, pneumonia and dysentery were marked in Bathurst in the early dry season and in the rains respectively, the former being largely due to the dry dusty air of the Harmattan.

Tetanus is a steady though relatively small factor in the native death-rate. Its high death-rate is in part due to the fact that cases are only brought to the European doctors when the infection is most pronounced and the patient *in extremis*.

The heavy rains from June to October were a marked feature, and constant care was necessary to cope with the breeding of *Stegomyia*. No case of yellow fever, however, occurred, although a careful lookout was kept for any possible case.

Malaria affords a large percentage of cases treated, which are generally speaking, however, of short duration and with a small fatality.

(b) EUROPEAN OFFICIALS.

The health of the European officials remained good. No deaths occurred and only two were invalided. Of the 29 cases entered on the sick list, malaria was the cause of 15, producing a total of 98 days on the sick list, and typhoid fever (one case) accounted for 60 days.

TABLE SHOWING THE SICK, INVALIDING, AND DEATH RATES OF EUROPEAN OFFICIALS.

	1913.	1914.
Total number of officials resident	53	56
Average number resident	32	34
Total number on sick list	21	29
Total number of days on sick list	201	313
Average daily number on sick list	0.55	0.84
Percentage of sick to average number resident	65.6	85.3
Average number of days on sick list for each patient	9.57	10.79
Average sick time to each resident	6.28	9.2
Total number invalided	3	2
Percentage of invalidings to total residents	5.66	3.5
Total deaths	1	—
Percentage of deaths to total residents	1.88	—
Percentage of deaths to average number resident	3.12	—
Number of cases of sickness contracted away from residence	—	—

Causes of invalidings :—appendicitis, typhoid fever.

(c) NATIVE OFFICIALS.

The health of the native officials has been fairly good. The longest period on the sick list was 84 days, following operation for appendicular abscess.

Both cases of death were over 50 years of age ; one a cemetery keeper, and the other an attendant at the Infectious Diseases Hospital.

TABLE SHOWING THE SICK, INVALIDING, AND DEATH RATE OF NATIVE OFFICIALS.

	1913.	1914.
Total number of officials resident	135	151
Average number resident	109	136
Total number on sick list	104	133
Total number of days on sick list	250	577
Average daily number on sick list	0.68	1.58
Percentage of sick to average number resident	0.95	97.8
Average number of days on sick list for each patient	2.40	4.33
Average sick time to each resident	2.29	4.24
Total number invalided	2	—
Percentage of invalidings to total residents	1.48	—
Total deaths	1	2
Percentage of deaths to total residents	0.74	1.32
Percentage of deaths to average number resident	0.9	1.47
Number of cases of sickness contracted away from residence	—	—

Causes of Deaths :—1 acute nephritis, 1 senile decay.

(d) GENERAL EUROPEAN POPULATION.

The general European population of the Gambia shows a slight decrease—the total in 1914 being 149, of whom 93 were non-officials.

TABLE SHOWING THE SICK, INVALIDING, AND DEATHS OF NON-OFFICIAL EUROPEANS.

	1913.	1914.
Total number resident	120	93
Total number on sick list	45	15
Total number invalided	3	6
Total deaths of residents	1	1
Total deaths from passing ships	—	—

Cause of death:—cerebral thrombosis.

Causes of invalidings:—malaria, tuberculosis, dysentery, hepatitis, appendicitis, typhoid fever.

(e) GENERAL NATIVE POPULATION.

Registration of births and deaths is only compulsory in Bathurst. From the return herein given, it will be noticed that infantile mortality remains very high; a fact which is largely attributable to the conservative ignorance of the native nurses.

COMPARATIVE STATEMENT OF BIRTHS AND DEATHS FOR THE PAST TEN YEARS IN THE COLONY.

Years.	Births.	Deaths.	Births in excess.	Deaths in excess.
1905	331	376	—	45
1906	338	359	—	21
1907	326	386	—	60
1908	351	387	—	36
1909	339	330	9	—
1910	363	385	—	22
1911	306	318	—	12
1912	303	336	—	33
1913	254	282	—	28
1914	304	344	—	40

NUMBER OF DEATHS AND DEATH RATE PER THOUSAND OF THE POPULATION FOR THE LAST TEN YEARS IN THE COLONY
(CALCULATED ON THE CENSUS OF 1911).

Years.	Estimated population.	Total deaths.	Death rate per 1,000.
1905	13,157	376	28·58
1906	13,157	359	27·27
1907	13,157	386	29·33
1908	13,157	387	29·41
1909	13,157	330	25·08
1910	13,157	385	29·26
1911	13,157	318	24·16
1912	13,157	336	25·53
1913	13,157	282	21·42
1914	13,157	344	26·14

MONTHLY DEATHS FOR THE PAST SIX YEARS IN BATHURST.

Years.				Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909	...	...	...	31	20	24	22	21	30	36	34	28	29	28	37
1910	...	...	...	29	21	20	17	23	30	21	31	35	31	29	25
1911	...	...	...	16	16	19	11	27	12	23	19	32	22	25	36
1912	...	...	...	19	9	12	17	19	28	20	26	32	34	27	25
1913	...	...	...	16	24	17	22	23	21	31	27	30	24	28	18
1914	...	...	...	13	25	15	33	33	28	30	26	32	29	29	16

INFANTILE MORTALITY FOR THE PAST EIGHT YEARS IN THE COLONY.

Years.				Total births.	Deaths over 1 year and under 5 years.	Deaths over 1 week and under 1 year.	Deaths over 1 day and under 1 week.	Deaths under 24 hours.	Still births.
1907	...	...	...	326	37	56	22	11	13
1908	...	...	...	351	55	77	23	—	32
1909	...	...	...	339	23	50	11	17	24
1910	...	...	...	363	40	68	34	11	27
1911	...	...	...	306	29	43	15	1	28
1912	...	...	...	203	42	66	6	—	26
1913	...	...	...	254	20	50	22	3	29
1914	...	...	...	304	27	59	16	5	27

Annual Sanitary Report

FOR THE

YEAR ENDING 31ST DECEMBER, 1914.

I. ADMINISTRATIVE.

The Senior Medical Officer is, by virtue of his position, also Chairman of the Board of Health of Bathurst, and controls the sanitary administration of the town, as well as that of the Protectorate.

The Senior Sanitary Officer of Sierra Leone has also been attached to the Gambia since the creation of the post in 1908, an appointment which, in the hands of Dr. R. H. Kennan, has been of the greatest value to this Colony. He has been associated with the progress of the most important schemes for the sanitary improvement of Bathurst, including especially the investigation of Cape St. Mary for a possible European cantonment, the carrying out of the "Dutton Scheme," and the inception and carrying out of a pipe-borne water supply for the town. In addition, Dr. Kennan's experience and advice on the countless smaller points arising in all sanitary matters has been placed freely at the disposal of this Government and has done perhaps more than any other factor to improve the general health conditions. The termination, at the end of this year, of his connection with the Gambia, owing to the pressing needs of Sierra Leone, is received with regret by all concerned.

The remaining European sanitary staff is composed of a Medical Officer of Health, a Town Warden, and an Assistant Town Warden of Bathurst. They are assisted by a staff of five native sanitary inspectors, and by gangs of labourers used in various sections of sanitary work.

By an arrangement introduced this year, the tour of service of both the Town Warden and Assistant Town Warden has been modified to allow of their presence in the Colony together during the greater part of the rainy season in this and ensuing years.

Unfortunately it was deemed necessary, on the declaration of war in August, to remove the Assistant Town Warden from his sanitary duties in Bathurst for a short time in order to assist in the military defences of Bathurst, and this Department was deprived of his services at a time when they, together with the services of all concerned, were very urgently required for sanitary work in Bathurst.

The sanitary labourers' buildings were completed and taken over in March. They consist of four blocks, capable of housing sixty men, and have proved of considerable value in maintaining and controlling the gangs.

The agreement by which part of a house in Buckle Street was leased for quarters for the Town Warden, and offices for the Board of Health and Medical Officer of Health, lapsed at the end of the year, and other arrangements may be found necessary. It is desirable that, as soon as possible, a special building should be erected by Government for these purposes.

The revenue of the Board of Health is derived from the rating of houses in Bathurst and other small items, such as slaughter house fees, market dues, etc., and is supplemented by an annual Government grant to cover the estimated expenditure. During the past two or three years a saving has been effected by the Board with the intention of ultimately spending it in larger improvements, but it was decided that this unexpended revenue should revert to Government at the close of the year and that, in future, the Government grant should be limited to cover the exact excess of expenditure over the Board's income as derived from other sources, so that no yearly saving will in future be possible.

The offices attached to the Board were held as follows during the year:—

Dr. T. F. G. Mayer, Ag.S.M.O., acted as Chairman of the Board until the 4th of February.

Dr. A. E. Horn, S.M.O., was Chairman of the Board from the 4th of February onwards.

Dr. A. F. Kennedy was Medical Officer of Health to the Board until he left the Colony on leave on 7th March, when the duties were performed by Dr. A. E. Horn, assisted by Dr. T. Ryan, from the 23rd of May, until the assumption of duty by Dr. R. W. Orpen on his arrival on the 16th of October.

Dr. R. H. Kennan visited Bathurst in January and again in April.

Mr. T. J. Gibbs, Town Warden, left the Colony on leave on 25th September.

Mr. G. B. Morey, Assistant Town Warden, arrived in Bathurst on 6th June, and acted for Mr. Gibbs during his absence.

Five native Sanitary Inspectors were employed in Bathurst throughout the year, one of whom acted as clerk to the Medical Officer of Health and Town Warden.

II. PREVENTIVE MEASURES.

(a) MOSQUITO- AND INSECT-BORNE DISEASES.

Malaria.

The comparatively heavy rains—more than double those of last year—which occurred from June to October were a marked feature, and constant care was necessary to cope with mosquito breeding.

During August the town of Bathurst was half under water, Lancaster Place, Albion Place, several neighbouring streets in Half-Die, and nearly the whole of Box Bar being 18 inches deep in water for days together. The sluice gates at each end of the town, which, of course, can only be opened at low tide, were not large enough to prevent the surface drains from overflowing, with the result that several of the more low-lying parts, not yet affected by sand filling, became waterlogged.

Small fish, however, were carried by the flood water into most parts of the town—for instance, MacCarthy Square, Government House grounds, and the Hospital compound—and, being voracious eaters of mosquito larvæ, helped to keep down *Anopheles*.

Oiling, sand filling, and trench cutting were also freely employed in suitable places.

Yellow Fever.

No case of yellow fever occurred in the Colony or Protectorate during the year, although the infection was notified as present on seven occasions in the Gold Coast, on four occasions in Nigeria, and once in Sierra Leone.

In the south and south-west parts of Bathurst, which constitute the business and native parts of the town, *Culex* and *Stegomyia* were both very prevalent, innumerable facilities for their breeding being provided in native compounds.

Any suspicious case of "fever" was immediately placed in a mosquito-proof room for treatment, but, in spite of careful investigation of all such cases, no yellow fever was found.

Mosquito Index.

The "Mosquito Index" of Bathurst, based on special examinations made by the Medical Officer of Health at or about the end of each quarter, shows an apparently high percentage of mosquito larvæ infected compounds. It was, unfortunately, owing to shortage of staff, only found possible to conduct two such examinations during the year, viz., in June and in October, when the indices were respectively 53 per cent. and 64 per cent. Both were, of course, taken during the rainy season.

It must, however, be pointed out that the special enquiries on which these figures were based were conducted in an extremely painstaking and searching manner. Every possible water-bearing vessel in a house and compound was thoroughly examined, with the aid of an electric torch where necessary, and the presence of even a single larva in one vessel caused the house and compound to be marked infected.

This has produced the high percentage which is so noticeable a feature. It is also a notable reflection on the manner in which inspections are carried out in the ordinary way by native sanitary inspectors, whose returns, for instance, during the September quarter, showed a mosquito index of 2·5 per cent.

The total number of water specimens taken and found infected was 1,036, of which 237 represent wells. Thus, 799 specimens were taken from jars, bottles, etc.; of these 799, which were taken and kept, 729 were *Stegomyia*, 53 were *Culex*, and 17 were mixed *Culex* and *Stegomyia*.

The nature of the receptacles in which larvæ may be found presents enormous variation—from cups and plates to church fonts—but it is noteworthy that the increasing use of rain-water tanks by natives has diminished the number of barrels or casks formerly used for water storage.

Reference to Table IV., Section 17, shows the number of inspections of houses made, notices served, summonses issued, etc., in Bathurst. An important concession granted to the Board of Health in November was the permission to ask for summonses without payment and the abolition of costs. This means a great saving of time and clerical work. The total fines inflicted during the year amount to £86 5s. 6d. It is of interest to record that two persons preferred to go to prison instead of paying fines.

A prolific source of *Culex* mosquitoes is the immense number of land-crab holes to the north-west of the town; from practically every one of these holes ten or twelve mosquitoes emerge when disturbed. The digging in of the

holes failed to stop the nuisance, as fresh outlets were dug by the crabs. Filling in with chloride of lime and stamping down proved successful in some cases.

An interesting discovery was the existence of a salt-water lagoon between the beach and the Cape Road to the north of the town, in which *Culex thalassius* larvæ were found in myriads. An analysis of the water showed a chlorine equivalent of 1·4 per cent.

Splenic Index.

An examination of the splenic index of the school children of Bathurst was made by Dr. R. W. Orpen in December, with the following results :—

			Examined.		Enlarged Spleens.		Splenic Index.
Boys	...	...	328	...	52	...	15·8 per cent.
Girls	...	...	192	...	30	...	16·1 „
			—		—		—
Total	...		520	...	82	...	15·7 „
			==		==		==

Trypanosomiasis.

Nothing notable has occurred in connection with this disease. Returns were obtained in June from the Travelling Commissioners as to the progress or fate of natives examined in 1911 by Drs. Todd and Wolbach for sleeping sickness, and the results, as far as known, have been forwarded to Dr. Todd. Unfortunately, considerable difficulty occurred in tracing several of the names, and only vague information could be obtained concerning them in many cases, but there was no evidence of any marked increase in the cases of the disease.

(b) EPIDEMIC DISEASES.

Plague.

Plague did not occur in the Gambia in 1914, but the septicæmic and bubonic forms were present through a great part of the year in French Senegal, which is contiguous with it.

On the declaration of infection at Dakar on the 14th of May, public notices explaining its nature and prevention were posted in Bathurst, quarantine was imposed, sulphur fumigation of the Government buildings, stores, outhouses, and stables in Wellington Street was carried out, and an active “rat campaign” was instituted. Material was also at once obtained and stored for the erection of isolation huts if required.

Quarantine was raised on the 13th of June, but was again declared on the 17th of July, owing to the reappearance of the disease in the outskirts of Dakar. The infection spread from Dakar to outlying towns, approaching the border in October, when there were grave apprehensions that it would appear in the North Bank Provinces of the Gambia, and so be carried to Bathurst.

Instructions were given to the Chiefs and Headmen, through the Travelling Commissioners, to prevent as far as possible the ingress of French subjects from infected or suspected towns into British Territory. At the same time, a strict watch was kept in Bathurst on all canoes and cutters bringing passengers from French country, and such passengers as were allowed to land were placed under surveillance for five days.

Information was received from the British Consul-General at Dakar in September, as follows :—

“ Since 17th July bubonic plague has been present at Dakar ;
 “ previous to that date there were some cases of septicæmic plague. Since
 “ the last quarantine was declared on 20th July, 416 cases of plague
 “ occurred, together with 74 suspected cases. There were 486 deaths.
 “ The disease is not entirely confined to natives, as there have been
 “ 3 cases of plague among the Europeans at Dakar, and 3 cases among
 “ the Mulattoes, of which 2 Europeans and 2 Mulattoes died. The
 “ disease is not entirely confined to Dakar, as cases have occurred in the
 “ near neighbourhood.”

Further information stated :—

November 1st to 10th	...	...	40 fatal cases.
„ 11th to 20th	...	...	20 „ „
„ 20th to 30th	...	...	21 „ „
December 1st to 10th	...	..	5 „ „
„ 11th to 20th	...	...	8 „ „
„ 21st to 31st	...	...	4 „ „

By the above it will be seen that 584 cases were fatal.

During these two periods of quarantine, all ships coming from Dakar were visited. In all, 53 craft have been examined.

Four ships and five cutters have been fumigated.

Six ships have been placed in quarantine.

Thirty-three natives have been sent back to French territory.

Twenty-nine Europeans have been placed under surveillance.

Seventy-three native passengers have landed, all of whom had certificates of vaccination with Haffkine's prophylactic serum.

Seven native passengers had their effects fumigated before being allowed to depart.

Small-Pox.

Small-pox appeared during the rains in the Protectorate. One or two cases occurred in Bathurst, but the disease did not spread.

In the Protectorate it assumed a more active form, affecting many villages, particularly in the South Bank Province.

Vaccination is an urgent necessity throughout the Protectorate, and I trust it will be found possible to carry it out more effectively in the ensuing year than was practicable this year.

In Bathurst, fumigation of infected houses and clothes was enforced.

In Bathurst, 1,267 vaccinations were performed, of which 943 were successful, and 139 were not seen afterwards.

In the Protectorate, 921 vaccinations were made.

Chicken-Pox.

Several cases occurred in virulent form in Bathurst, one death ensuing. An epidemic of sickness, reported from native sources to be small-pox, was found on investigation to be chicken-pox.

Isolation of cases was carried out where possible.

Dysentery.

A few cases of amoebic dysentery occurred in the Bathurst gaol in April. The rain-water tanks of the gaol being insufficient to last throughout the dry season, it has been the custom to mix the rain water with that obtained from an unofficial well. The boiling of all drinking water was ordered, but an adequate supply of tanks for the gaol is urgently required.

Beri-beri.

Beri-beri was diagnosed in the middle and early parts of the year among soldiers of the West African Frontier Force. It is interesting to note that the cases occurred among recruits from Sierra Leone, all, with one exception, being Mendis. Gambian soldiers, with whom in many cases the patients had shared the mess, were not affected.

(c) HELMINTHIC DISEASES.

Ankylostomiasis.

A few cases of ankylostomiasis occurred in the West African Frontier Force, but the infections were slight.

Guinea Worm.

Guinea worm is a comparatively uncommon disease throughout the Gambia.

III.—GENERAL MEASURES.

SEWAGE DISPOSAL.

The pan system of latrines is in common use in Bathurst for the public. For private persons also the Board of Health undertakes the organization of private latrines for a small payment; this system was introduced in order to effect the closing, as far as possible, of the many private cesspits in use. In some of the cases a free private pan latrine service was given for this purpose.

The nightsoil is emptied into the river. A new dejection jetty and a sanitary tramline are required.

In MacCarthy Island there is one public latrine over the river, otherwise no organized public latrine system exists throughout the Protectorate.

REFUSE DISPOSAL.

Three incinerators are in practically constant use, and have been supplemented when necessary by the burning of rubbish in selected spots. An astonishing amount of refuse in the way of tins is produced daily from the

native part of the town, for which there are three native public dustbins, and, in addition, a house to house collection is made twice weekly by the Board of Health carts throughout the town. The tins, etc., are roughly sorted out at the incinerators and buried in the low-lying areas of the town, where sand filling is in progress. The refuse, after burning, is screened and also used for filling, etc.

A site on the Victoria Embankment has been selected for a further incinerator, which is badly needed.

SURFACE DRAINS.

A revision and replanning of the surface drains of Bathurst is very desirable. Much has been done to replace the old grass-grown trenches which formerly served this purpose, but many still remain in Half-Die.

The cement or brick drains which exist are in some cases of an unsatisfactory type.

The low-lying nature of the site of Bathurst—some parts being at about sea-level and the highest point about twelve feet above sea-level—renders the question of drainage one of considerable difficulty. The drains have but little fall, and are guarded at their outlets by sluice gates which are opened at low tides during the rains, to allow flood water to escape.

Larger sluice gates are required at Box Bar, and the Picton Street drain should be extended, as there has been a good deal of silting up of sand on the beach at the site of the gate.

During the dry season the sluice gates are seldom opened, except to allow of occasional flushing of the drains by the tidal sea-water. The residual water that the drains then contain is stocked with small fish and does not breed mosquitoes.

Unfortunately, the fall of most of the drains is such that the main body of rain water is conducted from the greater part of the town into the large drain passing from Lancaster Place to the outlet at Box Bar. Consequently, this large drain is much overtaxed after heavy rain lasting for some days, and the greater part of Half-Die and nearly the whole of Box Bar become flooded by the water which overflows from it. The Picton Street, Blucher Street, Anglesea Street drains, etc., opening at the south-east of the town, do not do their full share towards carrying off flood water from the Half-Die area; nor will they be able to do so until they are properly graded towards the sea.

PIPE-BORNE WATER SUPPLY.

Considerable progress has been made with the proposed supply of pipe-borne water to Bathurst.

I attach a short report by the Resident Engineer of the water-works:—

“ Owing to local conditions the labour question has not presented
“ the difficulties experienced last tour and, up to the present, labour has
“ been fairly plentiful.

“ All works scheduled for this tour's programme are consequently
“ well in hand.

“ The 7½ miles of rising main and the nine miles of supply main are,
“ with the exception of a short length at the Oyster Creek Bridge,

“ completed, and the completion of the distribution mains in the town
“ is only a matter of a few days now.

“ At the source of supply near Lamin, the pumping works are
“ progressing rapidly in spite of the difficulties experienced in sinking
“ to the necessary levels in wet running sand, the tanks and pump well
“ are well in hand, the pumping machinery and engines are landed and
“ ready for erection.

“ The flow of water over the gauge remains constant at 300,000
“ gallons per day.

“ It is not intended to construct the reservoir this tour, but as soon
“ as the pumping station has been completed, which will be about May
“ next, it is intended to pump water direct into the town, for which
“ purpose the rising main and the supply main are connected together
“ near the reservoir site.”

It may be pointed out that there is no special arrangement for the filtration of the water at its point of collection, and before its transmission to Bathurst. The water will filter through a natural wall or bank of sandy soil into the sedimentation tank, but no arrangements are made for cleansing or renewing this filter bed when required.

The collecting area is, however, well protected from animal or human pollution by strong fencing for a considerable distance round.

An important requisite, and one that has not yet been arranged for, is the provision of a proper drainage system for waste water from private water supplies. Attention was called to this in the Annual Medical Report for 1913, and I must again insist on its importance.

“ DUTTON SCHEME.”

Steady progress has been made in the carrying out of this scheme, as approved by the Secretary of State, for the improvement of the town of Bathurst.

Sand-filling in the low-lying areas of Half-Die, Box Bar, The Marina, and Clifton Road, has been steadily undertaken by the Board of Health and the Public Works Department, with noticeable improvement in these places during the heavy rains of the year.

Many of the grass-grown trenches which formerly served the purpose of drains, and were great sources of anopheline mosquitoes, have now been filled in with sand through which rain water percolates easily. Semi-stagnant water is thus avoided in such places.

In the latter part of the year the efforts of both the Board of Health and Public Works Department were concentrated on the filling-in of part of Box Bar to allow of the early expropriation of the natives living in the north-west parts of Clifton Road and Victoria Road. This work will be completed early in 1915.

The following table shows the amount of filling accomplished in 1914:—

Sand-filling in Bathurst.

By Board of Health	...	...	...	...	24,428 cubic yards.
By Public Works Department	...	...	...	...	13,736 „
Total	...	...	...	...	<u>38,164 cubic yards.</u>

The materialisation of the "Dutton Scheme" which has now commenced renders it desirable to consider closely the prospective advantages which it is hoped to attain thereby.

These may briefly be described as the elimination of anopheline mosquitoes from Bathurst as far as possible, the filling-in of low-lying and swampy areas, and the expropriation of natives from the Clifton-Marine Roads area to filled-in areas in Box Bar, so that room for necessary Government quarters could be provided on the river front.

Of the value of the work already accomplished and in hand—the "filling-in"—there can be little doubt, but there is some room for question whether the scheme as approved will be effective in solving the difficult question of quarters in Bathurst.

The erection of bungalows along the Marina, between the Cable House and the Government Cemetery, is now in hand, and it has become apparent how little space for the purpose is at present available, or will become available, even when the approved filling-in of swamp and the contemplated expropriation of natives is finished.

An inter-bungalow space of 160 feet was at first proposed along the reclaimed part of the Marina, but the necessity for further quarters has caused the reduction of this space to 80 feet. This spacing will allow of five bungalows being built between the Cable House and the Cemetery, accommodating seven officers; four of these officers are already accommodated in the two double bungalows now erected, and a single bungalow is at present in course of erection, to be followed in time by two further single bungalows.

No closer congregation of Europeans in this quarter is advisable. The extreme proximity of the native quarter, even when the Clifton-Victoria Road natives are eventually expropriated, is a weighty reason against producing a congested area of European inhabitants in the neighbourhood.

Segregation is an essential factor if the proposed arrangement is to be permanently successful, and it must be pointed out that, even with the expropriation of natives now being considered, the result at present contemplated can only be a ridiculous parody of segregation in its proper meaning. For instance, when the Victoria Road and the north-east side of Clifton Road are cleared, there will be an open space between the bungalows and the native quarter behind of 90 yards, *i.e.*, about 50 yards between the compound of "No. 3 Bungalow" (nearest to the Cemetery) and the native quarter; and this space is to form the sole band of "segregation space" between Europeans and natives, while the expropriated natives themselves are eventually to be housed in the filled-in area in Box Bar, *which will be within 250 yards of the nearest European bungalows.*

When it is pointed out that the carefully considered opinion of the Second Conference of Principal Medical Officers of the West African Medical Staff, as shown on page 12 of their report, is that "the residential quarters of Europeans should be completely divided from the native town or communities by at least a quarter of a mile," it will be seen how utterly inadequate is the suggested band of separation in view at Bathurst. This is accentuated by the proposal to rehouse the expropriated natives within 250 yards of the nearest European quarters.

In addition, the land immediately to the west of this area, to be sand-filled for native occupation at Box Bar, is swampy, and not infrequently flooded at spring tides; it is so described on the map of Bathurst, and this land, in its turn, is adjacent to a large area of mangrove swamp, with its concomitant flies.

Obviously, therefore, the conditions obtaining in Bathurst are such as to demand a high degree of segregation for Europeans, and it is equally obvious that, unfortunately, this degree cannot be forthcoming. Bathurst is already crowded, and the natural outlet to extension, to the north-west, is inhibited by the old cemeteries and burial grounds. The present proposal to produce a closely confined area for European residences, almost in contact with part of the native town, offers no more than a bare provision for our immediate needs, and reveals the impossibility of providing suitable quarters for any future requirements in the way of increased European staff.

It must be remembered that, although the town and community of Bathurst is a small one, the amount of segregation required is not on that account less than is necessary in larger towns. Rats and mosquitoes have no less power of carrying plague or yellow fever and malaria in a small town than in a large one; nor will infected tsetse flies restrain their flight across a cleared space of about 90 yards out of respect to so-called "segregation."

What sad experience of epidemic and endemic disease in West Africa has shown to be requisite to afford a reasonable amount of protection to a body of Europeans, cannot safely be ignored in the present instance.

The scheme set forth by Dr. Dutton in 1902 is almost entirely concerned with malaria and its prevention by the destruction of mosquitoes and their breeding places. He points out in it that, in Bathurst, segregation can only be applied "in a small way . . . to the piece of land extending from the "beach to Clifton Road."

In the same paragraph (page 34, "Report of the Malaria Expedition to the Gambia, 1902," published by the Liverpool School of Tropical Medicine), he says:—

"The segregation principle should also be adopted when new administrative quarters are built in the Colony; new bungalows should not be erected within a distance of half-a-mile from the native quarter."

It is almost inevitable that, with the increased trade of the Colony, which judicious development will bring about, enterprises must be started which will involve the services of more Europeans, and it must be found in the near future that the arrangements now suggested for the accommodation of the present staff will have left no room for further requirements.

BUSH CLEARING, ETC.

The clearing of mangroves to the north-west of the town has been continued and maintained.

An area of 57,200 square yards has now been cut and cleared.

The burial grounds along the Cape Road have been cleared of undergrowth, and the grass kept cut.

The European Government cemetery has been put in proper repair, several tombstones and monuments being renovated. A plan of this cemetery has now been made and records kept of the graves and burial sites.

Cattle Corral.—A fresh site has been provided along the Cape Road, about two and a half miles from Bathurst, to be used as a cattle corral. Cattle from it are brought in overnight for slaughtering in Bathurst; a well is required for the watering of the cattle.

GOVERNMENT BUILDINGS.

The *Victoria Hospital*, Bathurst, which was erected in 1854, by no means fulfils modern requirements for a suitable hospital in the tropics. The European and native wards are side by side on the upper floor, under the same roof.

Each ward is mosquito-proofed, and the native ward further contains some mosquito-proof cages.

During the year, the whole hospital has been thoroughly cleaned and painted; spare woodwork round doors and windows has been removed and replaced by cement, and the sash windows replaced by casement windows.

A small room is fitted and used as a laboratory, but it is hot and ill-suited to the purpose.

No progress has yet been made with the building of the new separate male and female native wards, the out-patient building, post-mortem room or laundry.

The *Home for Destitutes* has been maintained in good condition. During part of the rainy season the male ward was occupied at night by the detachment of the West African Frontier Force guarding the cemetery trenches.

The *West African Frontier Force Lines*, to the north-west of Bathurst, have been increased by a slight addition of land to provide gardens and wash-houses for the men and their families.

The "*Sanitary Station*" in Wellington Street, which was set apart for the segregation of European contacts with yellow fever, plague, etc., has not been used for the purpose during the year. Its accommodation has been lessened by the removal of one room, now utilised as an office for the Legal Department.

No progress has been made in the building of a segregation camp at the site selected about two and a quarter miles from Bathurst along the Cape Road.

A *Detention Shed* was erected in November at Half-Die for the reception of natives who had arrived at Bathurst by canoe, etc., from towns infected, or suspected to be infected, with plague or other infectious disease. Such natives as appeared to have been in contact with the infection were to be detained under an Order-in-Council passed in November for the purpose, and either refused permission to enter the Island of St. Mary, or segregated, or placed under surveillance, as deemed necessary. As the Order, however, was not put in force, the shed has not been used.

The *Market* is in constant use and some new stalls have been erected. The meat exposed for sale has been under constant supervision, and it has only been necessary to condemn a small quantity as unfit for food, and that on account of decomposition. Generally speaking, the meat is excellent in quality, and only on two occasions has it been necessary to condemn a small portion of meat on account of infection with *Cysticercus bovis*.

The *Slaughter House* has been well looked after and is in constant use. The slaughterings during the year were:—

Bullocks	...	...	...	...	...	1,314
Sheep	...	...	...	...	...	187
Pigs	...	...	...	...	...	62
Goats	...	...	...	...	...	nil

A pump should be fixed, to allow of better cleaning.

STREETS.

The numbering of houses and compounds has now been completed, which greatly facilitates the work of the Board of Health. Some of the streets are now being straightened and encroachments rectified.

Additional street lamps and an improved system of lighting the town are very desirable.

Two streets adjacent to the Victoria Hospital compound have been declared closed, viz., the street leading north-east from Clifton Road, and that leading north-west from Bungalow Road along the south-west side of the Old Military Hospital. This will allow of an eventual extension of the hospital grounds for the accommodation of additional buildings.

WELLS AND TANKS.

There are 601 private wells in Bathurst, of which 94 have been stocked with larva-eating fish. All wells have been carefully watched as breeding places for mosquitoes, and larvæ were found in them on 237 occasions.

In the case of a well containing larvæ, a notice was served on the owner or occupier of the compound calling on him to stock the well with fish. It is curious to mention that the public will not go to the trouble of getting the fish for themselves, but apply to the Board of Health offices, where a stock is kept. This has its advantages, as the fact is recorded and the well marked down.

The proportion of wells to number of inhabitants in Bathurst—about 1 to 130 natives—is unduly high, but this is a matter which will receive attention immediately the pipe-borne supply of water is available in the town, which it is hoped will be by the middle of 1915.

The system of mosquito protection of many of the Government rain-water tanks in Bathurst was found to be unsatisfactory at the beginning of the rainy season, but immediate steps were taken to remedy this. Constant inspection of tanks was maintained by the Public Works Department throughout the rains.

A new form of mosquito protection of tanks has been devised, which entirely avoids the use of gauze at the inlet and outlet of water. It is hoped that this may be adapted experimentally to certain of the tanks before the onset of the next rains.

All pumps in Bathurst have now been numbered, which affords some help towards the important question of keeping them in order.

TEACHING OF HYGIENE.

Hygiene is taught in the schools of Bathurst; the subject is compulsory in Standards VI. and VII., and optional in Standards IV. and V. At the examination held in the subject during the year 42 scholars out of 151 passed.

A course of lectures was given to the teachers in October by Dr. Mayer, and, of ten who presented themselves for the subsequent examination, five obtained 50 per cent. of marks, while one Second Class and one Third Class certificate were awarded.

RECOMMENDATIONS FOR FUTURE WORK.

The following should be arranged for at an early date :—

- (a) A sanitary station.
- (b) The revision of the surface drainage of Bathurst.
- (c) Improved sluice gates.
- (d) An additional incinerator.
- (e) A sanitary tramline.
- (f) A sanitary dejection jetty.
- (g) An additional public latrine.
- (h) Pumps at the slaughter house and latrines.
- (j) Improved lighting of Bathurst.
- (k) A drainage system for private water supplies.
- (l) An Ordinance controlling noxious trades.

In concluding this brief review of the sanitary conditions of the Gambia in 1914, I think we may congratulate ourselves on avoiding any infection throughout the year with plague, of which a severe epidemic was in force for a prolonged period just over the borders, and with yellow fever, which was evident in neighbouring Colonies.

I wish also to acknowledge the great help in all matters of sanitation in Bathurst that has been afforded by Dr. R. W. Orpen, Medical Officer of Health, Mr. T. J. Gibbs, Town Warden of Bathurst, and Mr. G. B. Morey, Assistant Town Warden.

A. E. HORN,

Senior Medical Officer.

15th February, 1915.

VICTORIA HOSPITAL. IN-PATIENTS DURING 1914.

					Remaining in hospital, 31st Dec., 1913.	Admitted during 1914.	Died during 1914.	Remaining in hospital, 31st Dec., 1914.
Europeans	...	...	...	...	2	30	1	—
Natives	...	...	...	...	14	354	46	4
Syrians	...	...	...	...	—	13	1	—
West African Frontier Force	..				3	91	3*	—
Civil Police	...	...	...	...	1	45	—	—
TOTAL					20	533	51	4

* A carrier.

RESULT OF TREATMENT.

							Male.	Female.	Total.
Patients remaining in hospital, 1st January, 1914 ...							17	3	20
Patients admitted during 1914							455	81	536
TOTAL							472	84	556
Patients cured							258	38	296
Patients relieved... ..							147	32	179
Patients not relieved							16	6	22
Patients died							49	6	55
Remaining in hospital on the 31st December, 1914 ...							4	—	4
Average stay in days of patients who were discharged							7	4	—
Average stay of patients who died							5	2	—

RETURN OF INMATES AT THE HOME FOR DESTITUTES AND AFFLICTED
PERSONS FOR THE YEAR 1914.

Sex.	Remained, 1913.	Admitted, 1914.	Total.	Discharged.	Died.	Remaining, 1914.
Male	1	14	15	4	9	2
Female	2	5	7	1	3	3
TOTAL	3	19	22	5	12	5

CAUSES OF DEATHS.

Senile decay	...	...	...	...	...	...	2
Senility	...	...	...	...	...	...	1
Sleeping sickness		...	...	...	...	...	1
Senile debility	...	...	...	...	...	...	1
Acute nephritis	...	...	...	...	...	...	1
Hemiplegia	...	...	...	...	...	...	1
Exhaustion from diarrhoea		...	...	...	...	...	1
Paralysis	...	...	...	...	...	...	1
Phthisis	...	...	...	...	...	...	1
Meningitis	...	...	...	...	...	...	1
Syncope and debility	...	...	...	...	...	...	1
TOTAL							<u>12</u>

INFECTIOUS DISEASES HOSPITAL.

					Male.		Female.
Chicken-pox	...	...	...	...	12	...	—
Small-pox	...	...	...	...	1	...	3
TOTAL					<u>13</u>	...	<u>3</u>

THE PRISON INFIRMARY.

					Male.		Female.
Remained, 31st December, 1913	...				2	...	—
Admitted during 1914	...	...	...	...	30	...	—
TOTAL					<u>32</u>	...	<u>—</u>
Discharged during 1914	...	...	...	...	29	...	—
Died during 1914	...	...	...	...	—	...	—
TOTAL					<u>29</u>	...	<u>—</u>
Remaining, 31st December, 1914	...				3	...	—
					Male.		Female.
Total number of prisoners	...	...	...	...	127	...	6

Daily average number of prisoners, 29·79 (both sexes).

Sanitary arrangements, satisfactory.

THE PROTECTORATE.

The Medical needs of the Protectorate are provided for in part by the Medical Officer usually stationed at MacCarthy Island, who travels as required, and in part by the Senior Medical Officer or Medical Officer who usually accompanies the Governor on his tours of inspection.

Small-pox visited many towns and villages in the latter part of the year, and chicken-pox also was marked (*see* report by Dr. R. H. Miller, page 27).

MACCARTHY ISLAND.

MacCarthy Island Hospital and Dispensary was under the charge of Dr. F. C. V. Thompson from the beginning of the year until April, when he was relieved by Dr. R. H. Miller, and with the on-coming rainy season in June a native Dispenser remained in charge.

It was not practicable to station a Medical Officer here in the latter part of the year, but the station was visited and inspected by me in December.

The Hospital fills a useful position ; it is the only medical centre in the Gambia outside of Bathurst. It is not largely frequented except by natives in the immediate vicinity, but severe cases of illness and accident are occasionally brought for treatment from more outlying districts.

SCIENTIFIC.

TAMBA SAN SAN.

9th June, 1914.

To THE HON. SENIOR MEDICAL OFFICER.

SIR,

I beg to report that I have visited several towns where it was rumoured that there were outbreaks of small-pox.

Patients were also brought to me from other towns in the belief that they had some disease believed to be small-pox. Most of the cases seen by me are in my opinion not small-pox but chicken-pox. All the cases seen in children are of a mild type, but the older patients have taken the disease more severely.

In one case, a girl of about twenty years, the disease was extremely severe, and at first sight looked like very severe confluent small-pox; this I believe was due to the girl suffering previously from a certain degree of *acne vulgaris*.

In cases where I managed to get a definite history the patient complained of headache, and about three days later of an eruption—in some, four days, in others, about four or five days—which became vesicular and then dried up a few days later. In most cases patients said the spots appeared on different days, others maintained the spots all appeared at one time; but in the patient examined, this latter statement could not be true. On the appearance of the eruption the patient felt quite well.

In the case of the girl already mentioned, the patient also complained of extreme weakness and pain in the side coming on after the eruption.

The most suspicious case was that of a man at Basse, a native trader, who was better when I saw him. He gave a history of feeling extremely ill, pain in the head and general malaise, so severe as to prevent him attending to his business. About four days later an eruption appeared, the spots not all appearing at once, but on different days. There is a certain amount of pitting about the face, but I think this has been caused by scratching.

It is interesting to note that not one patient who has contracted the disease has been vaccinated, at least very few.

In one case of a mother and two children the mother and one child, both unvaccinated, have contracted the disease; the other child, who is vaccinated, has escaped.

The Dispenser at MacCarthy Island reports two cases from Manna, a town a few miles from Lamin Koto. He diagnosed small-pox, and has isolated the cases in Dr. Thompson's old compound, which I have turned into an isolation camp. I had previously been to Manna and vaccinated many children there, but curiously enough neither of these patients had come to me for vaccination.

I have written to the Dispenser to report more fully, but as chicken-pox seems to be fairly widely spread in the Protectorate, I am of opinion that these cases must be chicken-pox also.

I hear from natives that this disease frequently visits towns about here. They believe it to be a form of small-pox, but say that it leaves no marks behind like the other disease—a real small-pox. At the same time they all seem anxious to be vaccinated.

I have examined a case of supposed trypanosomiasis, one of four which Dr. Todd examined some three years ago; he had then enlarged cervical glands. The glands are still enlarged and discrete, but seem not to have increased in size, and at present there are no signs of sleeping sickness. I have taken a blood smear, but have not examined it as yet.

Of the other three cases, two have died; one diagnosed by Dr. Todd as sleeping sickness, the other diagnosed microscopically as having trypanosomiasis. The fourth patient cannot be traced up till now.

I have seen no suspicious case of sleeping sickness or yellow fever.

I have the honour to be,

Sir,

Your obedient servant,

R. H. MILLER,

Medical Officer.

RETURNS.

TABLE I.

MEDICAL STAFF.

Dr. A. E. Horn	...	...	...	Senior Medical Officer.
Dr. T. F. G. Mayer	...	...	...	Medical Officer.
Dr. R. W. Orpen	...	...	...	Medical Officer of Health.
Dr. F. C. V. Thompson	...	...	...	Medical Officer.
Dr. R. H. Miller	...	...	...	Medical Officer.
Dr. T. Ryan	...	...	...	Medical Officer.

NURSING STAFF.

K. M. Gordon	...	...	...	Nurse-in-charge.
L. E. H. Maulton	...	...	...	Nurse.
R. Roddan	...	...	...	Nurse.
P. R. di Menna	...	...	...	Nurse.
E. A. Bernard	...	...	...	Nurse.

MEMBERS OF THE SUBORDINATE STAFF.

C. Shaw	...	...	...	Clerk and Steward.
J. F. Jagne	...	...	...	Clerk.
J. F. Johnson	...	...	...	Chief Dispenser and Storekeeper.
J. S. Kennedy	...	...	...	Assistant Dispenser and Dresser.
J. J. Thomas	...	...	...	Assistant Dispenser and Dresser.
E. W. Johns	...	...	...	Assistant Storekeeper and Dispenser.
S. B. Palmer	...	...	...	Second Assistant Dispenser and Dresser.
(Vacant)	...	...	...	Junior Dispenser and Dresser.
M. Jobe	...	...	...	Ward Servant.
A. B. Goddard	...	...	...	Ward Servant.
P. Umayya	...	...	...	Ward Servant.
F. D. Jane	...	...	...	Ward Servant.
A. Sutton	...	...	...	Female Attendant.
L. H. C. Lewis	...	...	...	Female Attendant.
(Vacant)	...	...	...	Female Attendant.
J. T. Williams	...	...	...	Apprentice.
(Vacant)	...	...	...	Apprentice.

APPOINTMENTS.

Date.				Name.			Rank.
January	21	...	...	E. W. Harding	...	...	Ward Servant.
"	22	...	...	A. E. Horn	...	...	Senior Medical Officer.
February	1	...	...	J. F. Jagne	...	...	Sixth Grade Clerk.
"	18	...	...	J. B. Williams	...	...	Apprentice.
April	7	...	...	T. Ryan	...	...	Medical Officer.
May	7	...	...	K. M. Gordon	...	...	Nurse.
"	8	...	...	R. Roddan	...	...	Acting Nurse-in-charge.
"	23	...	...	K. M. Gordon	...	...	Nurse-in-charge.
June	1	...	...	L. H. C. Lewis	...	...	Female Attendant.
"	10	...	...	A. B. Goddard	...	...	Ward Servant.
July	8	...	...	P. Umayya	...	...	Ward Servant.
August	16	...	...	F. D. Jane	...	...	Ward Servant.
September	25	...	...	G. W. M'Carthy	...	...	Attendant, Infectious Diseases Hospital.
October	3	...	...	R. W. Orpen	...	...	Medical Officer of Health.
"	24	...	...	E. A. Bernard	...	...	Nurse.

LEAVE OF ABSENCE.

Date.	Name.	Rank.	Leave.
March 7 ...	A. F. Kennedy ...	Medical Officer... ...	4 months and 10 days.
February 1 ...	G. A. Saunders ...	Attendant, Home for Destitutes	1 month (sick).
April 29 ...	R. H. Kennan ...	Senior Sanitary Officer ...	4 months and 10 days.
May 8 ...	L. E. H. Maulton ...	Nurse	4 months.
„ 26 ...	J. F. Jagne ...	Sixth Grade Clerk ...	2 weeks.
June 4 ...	J. F. Johnson ...	Chief Dispenser and Storekeeper	1 month.
August 9 ...	F. C. V. Thompson ...	Medical Officer ...	90 days.
September 1 ...	S. B. Palmer ...	Second Assistant Dispenser ...	1 month.
„ 25 ...	R. Roddan ...	Nurse	4 months.
October 1 ...	J. S. Kennedy... ..	Assistant Dispenser ...	1 month.
December 4 ...	T. F. G. Mayer ...	Medical Officer ...	4 months.
„ 26 ...	K. M. Gordon... ..	Nurse-in-charge ...	70 days

TRANSFERS.

Date.	Name.	Rank.	Remarks.
April 8 ...	A. E. E. Whitton ...	Nurse-in-charge ...	To Nigeria.
„ 22 ...	J. A. Harley ...	Medical Officer ...	To Gold Coast.
„ 29 ...	S. L. Brohier ...	Medical Officer ...	To Gold Coast.
?	A. F. Kennedy ...	Medical Officer of Health	To Nigeria.
August 31 ...	L. E. H. Maulton ...	Nurse	To Cameroons on special service.

PROMOTIONS.

Date.	Name.	Rank.	Remarks.
January 1 ...	S. B. Palmer ...	Second Assistant Dispenser and Dresser.	From Junior Dispenser and Dresser.
„ 1 ...	M. Jobe ...	Senior Ward Servant ...	From Ward Servant.

TERMINATION OF APPOINTMENTS.

Date.	Name.	Rank.	Remarks.
January 19 ...	M. C. Valentine ...	Ward Servant ...	Dismissed.
February 6 ...	J. S. Thomas ...	Ward Servant ...	Dismissed.
April 2 ...	J. B. Williams ...	Apprentice ...	Terminated.
June 5 ...	E. Harding ...	Ward Servant ...	Resigned.
„ 30 ...	M. Harding ...	Ward Servant ...	Resigned.
August 15 ...	T. B. Williams ...	Apprentice ...	Terminated.
September 4 ...	J. Duncan ...	Attendant, Infectious Diseases Hospital.	Died.
December 31 ...	R. H. Kennan ...	Senior Sanitary Officer ...	Terminated.
„ 31 ...	T. F. G. Mayer ...	Medical Officer ...	Terminated.

TABLE II.

FINANCIAL.

MEDICAL DEPARTMENT.

EXPENDITURE.

Details.	Estimated.			Actual.		
	£	s.	d.	£	s.	d.
Personal emoluments	6,390	0	0	6,431	18	1
OTHER CHARGES.						
Bush allowance to Medical Officer at MacCarthy Island at 2s. 6d. a day	46	0	0	12	10	0
Travelling Expenses for Nurses in England	12	0	0	3	8	9
Maintenance of sick	513	0	0	563	14	9
Washing	70	0	0	63	12	10
Fuel	34	0	0	47	16	0
Equipment and sundries	100	0	0	223	17	7
Medicines, dressings and medical comforts	300	0	0	337	8	2
Expenses of burials	20	0	0	25	17	8
Vaccinations	200	0	0	179	7	7
Maintenance of lunatics at Sierra Leone	342	0	0	295	2	2
Infectious Diseases Hospital	10	0	0	4	4	3
Purchase of, and repairs to, instruments	40	0	0	76	5	0
Medical library	10	0	0	—		
Horse and bicycle allowances	233	0	0	162	18	10
Uniforms for attendants	30	0	0	31	4	0
Sea passages for Officers and Nurses	352	0	0	345	9	0
Fees for special course of instructions to Medical Officers in England	50	0	0	91	2	5
Maintenance of Destitute Home	164	0	0	102	0	8
New typewriting machine	26	0	0	20	16	0
Rent of quarters... ..	60	0	0	72	0	0
Special services rendered	—			4	0	0
Uniforms for Nurses	—			24	0	0
Outfit allowance to Dr. T. Ryan	—			12	0	0
TOTAL	£9,002	0	0	£9,130	13	9

RECEIPTS.

Details.	Estimated.			Actual.		
	£	s.	d.	£	s.	d.
Maintenance of sick and sale of medicines, etc. ...	100	0	0	172	19	10

TABLE II.
FINANCIAL.
BOARD OF HEALTH DEPARTMENT.

REVENUE.					EXPENDITURE.				
		£	s.	d.			£	s.	d.
Balance on 1st December, 1913	...	1,297	3	1	Salaries and allowances to Town				
Local rates	...	1,387	6	0	Warden and Staff	...	862	3	1
Slaughter-house fees	...	109	5	3	Uniforms	...	36	14	0
Grant in aid	...	2,327	0	0	Tools	...	66	6	9
Miscellaneous	...	57	15	11	Upkeep of horses and carts	...	432	11	11
Fines	...	14	16	6	Upkeep of street lights	...	194	4	4
Forfeited wages	...	9	3	6	Cleaning streets and drains	...	472	4	10
Over-wages	...	1	0	0	Emptying latrines	...	378	11	5
Adjustments	...	0	2	6	Emptying dustbins	...	178	16	7
Court summonses	...	1	0	0	Miscellaneous	...	99	3	8
					Crude oils and disinfectants	...	21	3	5
					Anti-mosquito measures	...	270	19	9
					Sea passages for officers	...	57	15	0
					Keeper of cemetery	...	24	0	0
					Cleaning of cemetery	...	85	12	7
					Repair and working of sluice gates	...	85	8	6
					Erection of dustbins	...	—		
					Cleaning of Government compound	...	93	5	1
					Rent of quarters	...	60	0	0
					Cost of summonses	...	0	10	0
					Total expenditure	...	3,419	10	11
					Balance on 31st December, 1914...	1,785	1	10	
Total	...	£5,204	12	9	Total	...	£5,204	12	9

TABLE III.
RETURN OF STATISTICS OF POPULATION FOR THE YEAR 1914
OF THE COLONY OF THE GAMBIA.

				Europeans and whites.	Africans and other races.	Mixed and coloured.
Number of inhabitants, 1914 (Census 1911)	...	...	...	230*	7,470	—
„ births during 1914	...	...	...	—	304	—
„ deaths during 1914	...	...	...	—	344	—
„ immigrants during 1914	...	...	...	—	—	—
„ emigrants during 1914	...	...	...	—	—	—
„ inhabitants, 1913	...	...	...	230	7,470	—
Increase or	...	...	...	—	—	—
Decrease	...	...	...	—	—	—

* 40 in ships.

TABLE IV.

SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR
IN THE TOWN.

1. NAME OF TOWN.—BATHURST.

—	Approximate area.	Number of proclaimed open spaces.
1912	400 acres.	One—5·68 acres surveyed (previously under estimated).
1913	400 „	Do.
1914	400 „	Do.

2. POPULATION.

—	Number of Natives.	Number of Europeans.	Total.
1912	} *7,470	230	7,700
1913			
1914			

* 1911 Census.

3. HOUSING.

—	Number occupied by Europeans.	Number occupied by Natives.
Number of Houses :—		
1912	22	Schedule not completed. Do. 1,899
1913	34	
1914	34	
Number of Huts :—		
1912	} Schedule not completed. 713	
1913		
1914		

4. MOSQUITO PROTECTION OF HOUSES.

—	1912.	1913.	1914.
Number of European houses wholly mosquito-protected ...	1	5	7
Number of European houses with mosquito room	28	24	23
Number rendered during the year wholly mosquito-protected	1	5	2
Number rendered during the year partially mosquito-protected	7	2	Nil.

5. ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1912.	1913.	1914.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	—	—	1
Number of houses erected with sanction as to site, construction, and relation to other buildings	—	—	3
Number of huts erected with sanction as to site, construction, and relation to other buildings	—	—	Not known.
Number of houses built without sanction	—	—	Not known.
Number of huts built without sanction	—	—	Not known.

ACTION TAKEN.

	Number of Prosecutions.		Number Demolished.	
	Huts.	Houses.	Huts.	Houses.
1912	None.	None.	None.	None.
1913				
1914				

6. MARKETS.

	Total number.	Number paved and drained.	Number unpaved.
1912	1	1	Nil.
1913	1	1	Nil.
1914	1	1	Nil.

7. SLAUGHTER-HOUSES.

	Total number.	Number paved and drained.	Number unpaved.
1912	2	1	1 built over sea.
1913	2	1	1 " " "
1914	2	1	1 " " "

8. LATRINES.

	For Males.		For Females.	
	Number.	Number of seats.	Number.	Number of seats.
Number of Public Latrines :—				
1912	10	40	10	40
1913	10	42	10	42
1914	10	42	10	42
Number of new Public Latrines erected during the year :—				
1912	} Nil.	Nil.	Nil.	Nil.
1913				
1914				
Number of Public Latrines repaired during the year :—				
1912	Nil.	Nil.	Nil.	Nil.
1913	7	29	7	29
1914	All attended to as required.			
Number of Public Latrines demolished during the year :—				
1912	} Nil.	Nil.	Nil.	Nil.
1913				
1914				

	1912.	1913.	1914.
Number of Private Latrines	750	550	?
Average number of pails of nightsoil removed daily	300	500	?
Average number of soiled pails removed and clean pails substituted	300	188	198
Number of nightsoil men employed to clean latrines and remove excreta	14	16	17
Number of cesspools	200	Unknown	338
Number of cesspools cleansed	Nil.	Nil.	79
Number of new cesspools constructed during the year... ..	—	—	Nil.
Number of old cesspools abolished	3	2	30
Number of cesspools oiled regularly by Department	Nil.	Nil.	18

9. REMOVAL OF REFUSE.

	1912.	1913.	1914.
Number of dustbins	{ 500	500	500
Number of carts at work daily to remove refuse from streets ...		4	4
Amount of refuse removed daily... ..	1	6	6
Number of carts at work daily to remove refuse from yards and premises... ..	10*	5*	5*
Amount of refuse removed daily from yards and premises ...	4	6	5
Number of men employed for moving refuse	40*	68*	60*
	15	19	19

* Cartloads.

10. MODE OF DISPOSAL OF EXCRETA, REFUSE, AND OFFAL.

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of Slaughter House and Market Offal.		
	1912.	1913.	1914.	1912.	1913.	1914.	1912.	1913.	1914.
Buried or trenched ...	—	—	—	6	3	—	—	—	All offal thrown direct into the sea.
Burnt ...	—	—	—	44	52	—	—	1	
Thrown into sea ...	300	688	—	—	—	—	2	$\frac{1}{4}$	
Otherwise dealt with ...	—	—	—	—	—	—	—	—	

11. AVERAGE DAILY NUMBER OF CARTLOADS OF TIN CANS, BOTTLES, BROKEN CROCKERY, AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS, AND COMPOUNDS.

1912.	1913.	1914.
6	3	3

12. WATER SUPPLY.

Nature of Water Supply.	1912.	1913.	1914.
Pipe-borne water :—			
Source (river, lake, or spring) :—			
Number of linear yards ...	Nil.	Nil.	Under construction.
Number of stand-pipes along roads ...	—	—	—
Number of stand-pipes in compounds and houses ...	—	—	—
Wells :—			
Public :—			
Number ...	26	26	26
Number with pumps protected against surface water and mosquito-protected ...	26	26	26
Private :—			
Number ...	} Schedule being made.	}	601
Number protected against surface water and mosquito-protected...			94 fish-stocked
Tanks :—			
Public—Government Quarters :—			
Number underground ...	Nil.	Nil.	4
Number mosquito-protected and served by pumps ...	—	—	3
Number above ground ...	—	—	149
Number mosquito-protected ...	—	—	149
Number of 400 gallons capacity or less ...	—	—	144
Number above 400 gallons ...	—	—	5

Nature of Water Supply.	1912.	1913.	1914.
Tanks :—			
Private :—			
1. Number underground	5	6	6
2. Number mosquito-protected	5	6	6
3. Number above ground	—	190	315
4. Number mosquito-protected	—	190	315
5. Number of 400 gallons capacity or less	110	178	303
6. Number above 400 gallons	12	12	12
Nature of tanks :—			
Wood	—	—	Nil
Iron	117	190	309
Concrete	—	6	6
Barrels :—			
Number	{ Unknown, number greatly reduced.	{ Diminish- ing.	{ Diminish- ing.
Number mosquito-protected			

Nos. 3 and 4 include Nos. 5 and 6.

13. DRAINAGE.

Nature of drainage.	Public.	Private.
Masonry drains :—		
Lineal yards of masonry drains :—		
1912	5,617	
1913	5,617	
1914	5,617	
Lineal yards reconstructed during the year :—		
1912	Nil.	
1913	Nil.	
1914	33	
Lineal yards repaired during the year :—		
1912	Nil.	
1913	1,183	
1914	773	24
Lineal yards of new drains constructed during the year :—		
1912	Nil.	
1913	Nil.	
1914	Nil.	
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :—		
1912	9,433	
1913	9,433	
1914	9,433	
Number of linear yards of ditches dug and graded :—		
1912	All earth drains made wider.	
1913	Maintained	
1914	Maintained	
Average frequency of clearing ditches of grass :—		
1912	{ Weekly during rains.	{ Weekly during rains.
1913		
1914		

14. CLEARANCE OF UNDERGROWTH, LONG GRASS, AND JUNGLE.

—	1912.	1913.	1914.
Number of square yards of weeds, grass, and vegetation cut and removed	200,000	400,000	400,000
Average frequency of clearance of rank vegetation on same area	<div> <div>Three times between May and June.</div> <div>Monthly.</div> </div>		Monthly.

15. EXCAVATIONS AND LOW-LYING LAND.

—	1912.	1913.	1914.
Number of pools and excavations	same	much diminished	greatly diminished.
Number of excavations filled up	154	50	?
Amount of low-lying and marsh land raised and drained ...	4,000 sq.yds.	21 acres.	?
Number of pools, marshes, streams, &c., fish stocked	same	same	as water rises.
Number of cubic yards of material used for filling up pools and excavations	1,000	1,000	?
Number of persons fined for making new excavations	Nil.	Nil.	Nil.
Average number of men daily employed in filling up pools, &c.	10	10	as required.

16. OILING.

—	1912.	1913.	1914.
Number of drains oiled	None,	all fish stocked.	
Number of pools and excavations oiled	—	150	100
Number of tanks and barrels oiled	Nil.	Nil.	33
Average number of men daily employed for oiling drains, pools, and water-tanks or barrels	—	1	1

17. INSPECTIONS AND PROSECUTIONS.

—	1912.	1913.	1914.
Number of inspectors employed	4	4	5
Number of houses inspected	12,521	19,435	45,587
Number of houses where larvæ were found	622	957	1,036
Number of notices served to remove conditions causing the breeding of larvæ	250	98	665
Number of persons fined for having mosquito larvæ on premises	9	164	198
Number of notices served to remove insanitary conditions on premises	52	145	977
Number of persons fined for not removing insanitary conditions after notice	1	Nil.	12
Number of soda and aerated water factories inspected...	1	1	1
Number of persons fined for obstruction	—	—	2

TABLE V (A).

METEOROLOGICAL RETURN FOR THE YEAR 1914.—BATHURST.

Months.	Temperature.				Rainfall.	Wind.
	Shade maxi- mum.	Shade mini- mum.	Range.	Mean.	Amount in inches.	General direction.
January	90	60	30	75·0	—	North West.
February	93	60	33	76·5	—	„
March	101	60	41	80·5	—	„
April	100	60	40	80·0	—	„
May	95	62	33	78·5	—	Variable.
June	99	64	35	81·5	2·98	„
July	90	68	22	79·0	3·76	„
August	87	63	24	75·0	27·86	North West.
September	90	63	27	76·5	11·34	„
October	95	66	29	80·5	2·59	„
November	90	60	30	75·0	0·38	„
December	86	53	33	69·5	—	„
AVERAGE	93·0	61·5	31·4	77·2	48·91 Total.	—

TABLE V (B).

METEOROLOGICAL RETURN FOR THE YEAR 1914.—MACCARTHY ISLAND.

Months.	Temperature.				Wind.	Rainfall.
	Shade maxi- mum.	Shade mini- mum.	Range.	Mean.		Amount in inches.
January	98	60	38	79·0	North.	0·30
February	105	65	40	85·0	„	—
March	109	67	42	88·0	„	—
April	113	70	43	91·5	„	—
May	114	68	46	91·0	„	—
June	109	—	—	—	„	2·62
July	102	—	—	—	„	3·09
August	96	—	—	—	„	14·23
September	98	—	—	—	„	7·39
October	99	—	—	—	„	2·01
November	102	55	47	78·5	„	0·80
December	98	50	48	74·0	„	—
AVERAGE	103·5	62·1	43·4	83·8	—	30·44 Total.

TABLE VI.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1914.

Diseases.	Remaining end of 1913.				Admissions, yearly total.				Deaths, yearly total.				Total cases treated.				Remaining in hospital at end of 1914.				Remarks.
	Bathurst.	Prison.	MacCarthy Island.	Total.	Bathurst.	Prison.	MacCarthy Island.	Total.	Bathurst.	Prison.	MacCarthy Island.	Total.	Bathurst.	Prison.	MacCarthy Island.	Total.	Bathurst.	Prison.	MacCarthy Island.	Total.	
Malarial fevers ...	2	—	—	2	85	5	1	91	3	—	—	3	87	5	1	93	2	—	—	2	
Blackwater fever ...	—	—	—	—	—	—	1	1	—	—	—	—	—	—	1	1	—	—	—	—	
Small-pox ...	—	—	—	—	—	—	1	1	—	—	—	—	—	—	1	1	—	—	—	—	
Dysentery ...	—	—	—	—	28	22	1	51	5	—	—	5	28	22	1	51	—	—	—	—	
Sleeping sickness ...	2	—	—	2	5	—	—	5	1	—	—	1	7	—	—	7	—	—	—	—	
Gonorrhœa ...	—	—	—	—	7	—	—	7	—	—	—	—	7	—	—	7	—	—	—	—	
Parasitic disease... ..	—	—	—	—	11	1	—	12	—	—	—	—	11	1	—	12	1	—	—	1	
Tetanus ...	—	—	—	—	6	—	—	6	3	—	—	3	6	—	—	6	—	—	—	—	
Rheumatism ...	2	—	—	2	18	2	2	22	—	—	—	—	20	2	2	24	—	—	—	—	
Alcoholism ...	—	—	—	—	1	—	—	1	—	—	—	—	1	—	—	1	—	—	—	—	
Debility ...	—	—	—	—	7	—	—	7	1	—	—	1	7	—	—	7	—	—	—	—	
Syphilis ...	—	—	—	—	7	—	—	7	1	—	—	1	7	—	—	7	—	—	—	—	
Beri-beri ...	—	—	—	—	31	—	—	31	1	—	—	1	31	—	—	31	—	—	—	—	
Typhoid fever ...	—	—	—	—	2	—	—	2	—	—	—	—	2	—	—	2	—	—	—	—	
Septicæmia ...	—	—	—	—	3	—	—	3	2	—	—	2	3	—	—	3	—	—	—	—	
Diseases of the nervous system ...	1	—	—	1	20	—	—	20	2	—	—	2	21	—	—	21	—	—	—	—	
" " eye ...	—	—	—	—	6	1	1	8	—	—	—	—	6	1	1	8	—	—	—	—	
" " ear ...	—	—	—	—	1	—	—	1	—	—	—	—	1	—	—	1	—	—	—	—	
" " circulatory system ...	—	—	—	—	17	—	—	17	5	—	—	5	17	—	—	17	—	—	—	—	
" " respiratory system ...	2	—	1	3	60	1	10	71	8	—	3	11	62	1	11	74	—	—	—	—	
" " digestive system ...	2	—	—	2	65	—	14	79	10	—	1	11	67	—	14	81	—	—	1	1	
" " lymphatic system ...	1	—	—	1	15	—	2	17	5	—	1	6	16	—	2	18	—	—	—	—	
" " urinary system ...	—	—	—	—	14	—	—	14	3	—	—	3	14	—	—	14	—	—	—	—	
" " generative system ...	—	—	—	—	22	—	—	22	—	—	—	—	22	—	—	22	—	—	—	—	
Affections connected with pregnancy and parturition ...	1	—	—	1	12	—	—	12	2	—	—	2	13	—	—	13	1	—	—	1	
Diseases of the organs of locomotion ...	2	—	—	2	6	1	3	10	—	—	—	—	8	1	3	12	—	—	—	—	
" " connective tissue ...	1	—	—	1	16	1	—	17	—	—	—	—	17	1	—	18	—	—	—	—	
" " skin ...	—	—	—	—	17	2	8	27	—	—	—	—	17	2	8	27	—	—	1	1	
Injuries ...	4	—	1	5	40	—	5	45	3	—	—	3	44	—	6	50	—	—	—	—	
Poisons ...	—	—	—	—	5	—	—	5	—	—	—	—	5	—	—	5	—	—	—	—	
No appreciable disease ...	—	—	—	—	9	1	—	10	—	—	—	—	9	1	—	10	—	—	—	—	
Surgical operations ...	—	—	—	—	38	—	—	38	7	—	—	7	38	—	—	38	—	—	—	—	
TOTAL ...	20	—	2	22	574	37	49	660	62	—	5	67	594	37	51	682	4	—	2	6	

TABLE VII.

OUT-PATIENTS.

SHOWING DETAILS OF CASES IN 1914.

Diseases.	Bathurst.	Prison Infirmary.	MacCarthy Island.	Total.
Malarial fevers	594	31	69	694
Beri-beri	6	1	—	7
Small-pox	—	—	4	4
Anæmia	100	12	1	113
Gonorrhœa	35	2	27	64
Debility	35	9	32	76
Dysentery	38	26	10	74
Malarial cachexia	18	—	—	18
Marasmus	2	1	2	5
Rheumatism	668	47	158	873
Syphilis	9	6	22	37
Sleeping sickness	7	—	1	8
Parasitic diseases	613	15	53	681
Croup	—	—	1	1
Goitre	—	—	5	5
Diseases of the nervous system ...	491	5	28	524
" " " eye	389	7	44	440
" " " ear	131	12	22	165
" " " nose	31	2	5	38
" " " circulatory system ...	479	1	8	488
" " " respiratory system ...	2,072	31	99	2,202
" " " digestive system ...	2,493	81	429	3,003
" " " lymphatic system ...	65	5	11	81
" " " urinary system ...	32	3	18	53
" " " generative system ...	42	5	31	78
Affections connected with pregnancy ...	8	—	2	10
" " " parturition ...	5	—	—	5
Diseases of the female breast ...	5	2	1	8
" " " organs of locomotion ...	90	—	—	90
" " " connective tissues ...	237	19	12	268
" " " skin	575	25	166	766
Injuries	510	32	49	591
Undefined	—	6	13	19
TOTAL	9,780	386	1,323	11,489